

### Claims

1. A transparent acrylate pressure-sensitive adhesive comprising a filler, **characterized in that** the acrylate pressure-sensitive adhesive comprises a polyacrylate and particles of silicate and/or of silica gel, the particles of silicate and/or of silica gel having a size of not more than 50 nm.

2. The acrylate pressure-sensitive adhesive of claim 1, **characterized in that** the particles of silicate and/or of silica gel have a size of not more than 10 to 30 nm.

3. The acrylate pressure-sensitive adhesive of one of claims 1 and 2, **characterized in that** the particles of silicate and/or of silica gel are present with a weight fraction of 0.5 to 25 relative to the unfilled silicate/silica gel.

4. The acrylate pressure-sensitive adhesive of one of claims 1 to 3, **characterized in that** the polyacrylate is obtainable from a comonomer composition comprising

a) acrylic acid and methacrylic acid derivatives of the general formula (I), with a fraction of 70 to 100 percent by weight,



where  $\text{R}_1 = \text{H}$  or  $\text{CH}_3$  and  $\text{R}_2 = \text{H}$  or an alkyl chain having 2 to 20 carbon atoms, such as butyl, pentyl, hexyl, heptyl, octyl, isooctyl, 2-methylheptyl, 2-ethylhexyl, nonyl, decyl, dodecyl, lauryl or stearyl (meth)acrylate or (meth)acrylic acid, and

b) vinyl compounds comprising functional groups, with a fraction of 0 to 35 percent by weight.

5. The acrylate pressure-sensitive adhesive of one of claims 1 to 4, **characterized in that** the vinyl compound is a maleic anhydride, a styrene, a styrene compound, a vinyl acetate, a (meth)acrylamide, an N-substituted (meth)acrylamide, a  $\beta$ -acryloyloxypropionic acid, a vinyl acetic acid, a fumaric acid, a crotonic acid, an aconitic acid, a dimethylacrylic acid, a trichloroacrylic acid, an itaconic acid, a hydroxyalkyl (meth)acrylate, an amino-containing (meth)acrylate, a hydroxyl-

containing (meth)acrylate, a 2-hydroxyethyl (meth)acrylate, a 2-hydroxypropyl (meth)acrylate, and/or a 4-hydroxybutyl (meth)acrylate.

- 5      6.      The acrylate pressure-sensitive adhesive of one of claims 1 to 5, **characterized in that** the vinyl compound is a double-bond-functionalized photoinitiator.
- 10      7.      The acrylate pressure-sensitive adhesive of one of claims 1 to 6, **characterized in that** the particles of silicate and/or of silica gel have been functionalized with a free-radical initiator.
- 15      8.      The acrylate pressure-sensitive adhesive of one of claims 1 to 7, **characterized in that** the particles of silicate and/or of silica gel have been coated with a polyacrylate coat.
- 20      9.      The acrylate pressure-sensitive adhesive of one of claims 1 to 8, **characterized in that** the polyacrylate of the pressure-sensitive adhesive and of the particle coating are substantially identical.
- 25      10.      A process for preparing an acrylate pressure-sensitive adhesive of one of the preceding claims, **characterized in that** the acrylates and comonomers are polymerized in the presence of at least one organic solvent or in bulk, the particles of silicate and/or of silica gel being mixed in.
- 30      11.      The process of claim 10, **characterized in that** the particles of silicate and/or of silica gel having a maximum size of 50 nm, in particular from 10 to 30 nm, are mixed in.
12.      The process of one of claims 10 and 11, **characterized in that** the particles of silicate and/or of silica gel are mixed in with a weight fraction of 0.5 to 25 relative to the unfilled silicate/silica gel.
13.      The process of one of claims 10 to 12, **characterized in that** the particles of silicate and/or of silica gel are functionalized with a free-radical initiator in an upstream operation.

14. The process of one of claims 10 and 13, **characterized in that** the particles of silicate and/or of silica gel are mixed in during or after the polymerization.
- 5 15. The process of one of claims 10 to 14, **characterized in that** the particles of silicate and/or of silica gel are coated with a polymer, the polyacrylate of the acrylate pressure-sensitive adhesive and of the particle coating being substantially identical.
- 10 16. The process of one of claims 10 to 15, **characterized in that** the acrylate pressure-sensitive adhesive is crosslinked by UV irradiation in the range from 200 to 400 nm.
- 15 17. The process of one of claims 10 to 16, **characterized in that** the acrylate pressure-sensitive adhesive is crosslinked by ionizing radiation or by thermal crosslinking.
18. The use of the acrylate pressure-sensitive adhesive of one of claims 1 to 9 for producing acrylate pressure-sensitive adhesive tapes.